s18quiz: EXP LOG (SLTN v297)
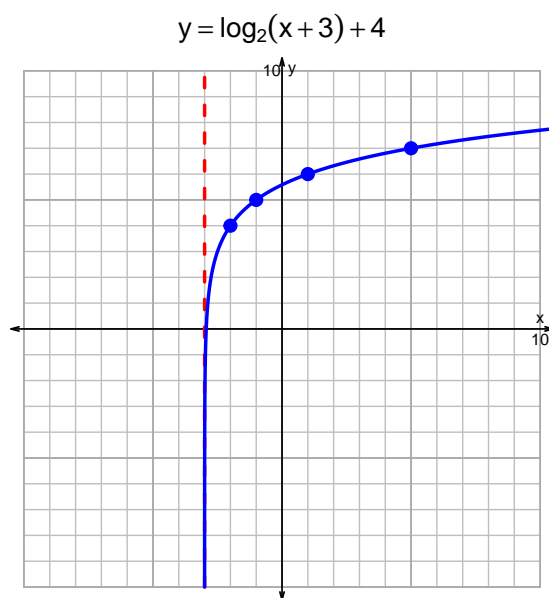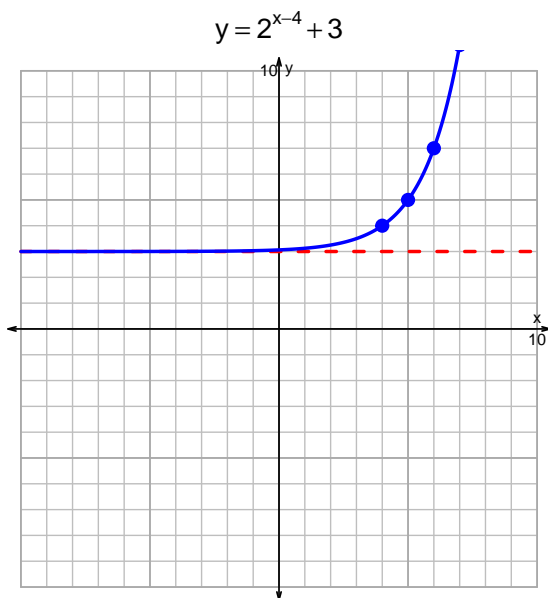
1. Graph $y = 2^{x-4} + 3$ and $y = \log_2(x+3) + 4$ on the grids below. Also, draw any asymptotes with dotted lines.

$$y = 2^{x-4} + 3$$

$$y = \log_2(x+3) + 4$$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-13 = \left(\frac{-5}{3}\right) \cdot 2^{-7t/4}$$

Divide both sides by $\frac{-5}{3}$.

$$\frac{13 \cdot 3}{5} = 2^{-7t/4}$$

Take log, base 2, of both sides.

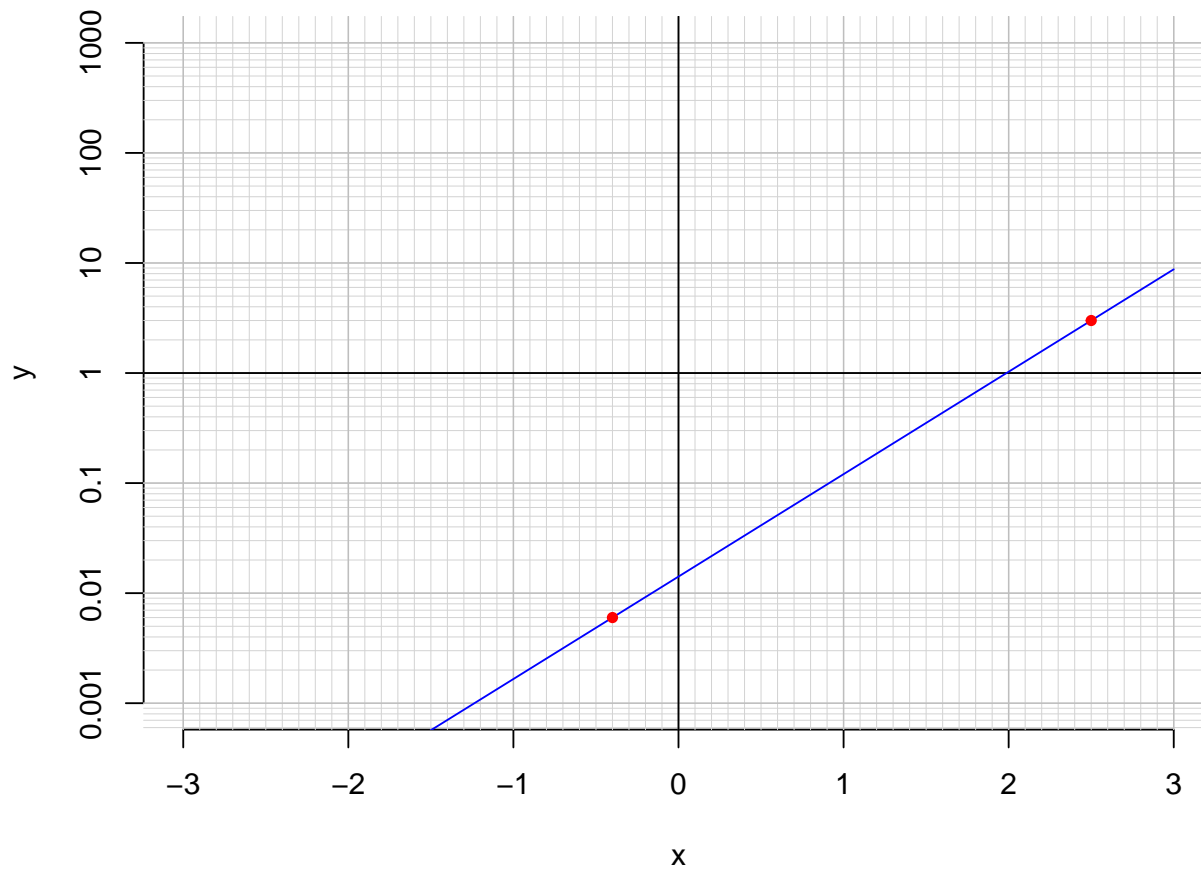$$\log_2\left(\frac{13 \cdot 3}{5}\right) = \frac{-7t}{4}$$

Divide both sides by $\frac{-7}{4}$.

$$\frac{-4}{7} \cdot \log_2\left(\frac{13 \cdot 3}{5}\right) = t$$

Switch sides.

$$t = \frac{-4}{7} \cdot \log_2\left(\frac{13 \cdot 3}{5}\right)$$

3. An exponential function $f(x) = 0.0141 \cdot e^{2.14x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(2.5)$.

$$f(2.5) = 3$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{1}{2.14} \cdot \ln\left(\frac{x}{0.0141}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.006)$.

$$f^{-1}(0.006) = -0.4$$